

NATIONAL BAT COMPLIANCE

The following sections describe how waste activities at the proposed inert landfill and materials recovery / recycling facility at Ballinclare Quarry comply with the relevant requirements of BAT. For the purposes of this appraisal, the reference BAT guidance is taken to be *BAT Guidance Note for Waste Sector : Landfill Activities*, published by the Agency in December 2011.

Environment impacts associated with inert waste disposal and materials recovery / recycling activities could include

- (i) Potential dust emissions arising from unloading, placement and compaction of imported topsoil, soil and stone and trafficking of HGV's over unpaved haul roads;
- (ii) Potential carbon dioxide (CO₂) emissions from plant and equipment working at the facility;
- (iii) Potential noise emissions / noise nuisance associated with working plant and HGVs;
- (iv) Potential contaminant emissions to land, surface waters and groundwater, specifically from placement of non-inert waste and spills / leaks of fuel and oil;
- (v) Potential nuisance associated with transport of mud onto the local road network;
- (vi) Inadequate planning and financial provision for potential environmental liabilities, closure, restoration and aftercare of the proposed facility;
- (vii) Poor environmental management and control of waste activities at the facility;

The waste materials imported to and managed at the proposed inert landfill at Ballinclare Quarry are, by definition physically, chemically and biologically unreactive and will not therefore alter or adversely affect any other matter in contact with it in a way which would give rise to environmental pollution or harm human health. As such, the waste will not generate leachate, landfill gas or odour emissions, nor will it give rise to litter nuisance or attract vermin or birds, which would also create further potential nuisance.

It is considered that each of the potential impacts of the proposed waste facility can be addressed through the application of the following best available techniques to minimise emissions or to manage / control them.

Air (Dust) Emissions

A number of measures are in place to minimise and manage air (principally fugitive dust) emissions at Ballinclare Quarry. The following BAT measures in respect of potential dust generation activities will be implemented at the waste facility in order to minimise and control dust emissions:

All Activities

- Use of mobile water bowsers to damp down particulate materials across the entire site, as and when required, principally in windy periods during extended dry spells.

Inert Waste Placement and Backfilling

- Damp down inert waste / soil / particulate materials as and when required;
- Restrict access to areas once they are backfilled / restored;
- Avoid inert waste / soil handling during adverse (dry, windy) weather conditions and optimising timing of any site operations and/or development works;
- Place and compact imported inert waste / soil in-situ immediately after being unloaded (to minimise windblown particulate matter);
- Minimise drop heights at all times (to minimise emissions);

Stockpiling

- Minimise stockpiling of imported inert waste / soil / particulate materials;
- Use water sprays on soil stockpiles when necessary;
- Locate stockpiles within quarry void to take advantage of shelter from wind;
- Minimise stockpile mound heights at all times (to minimise emissions);

Traffic Movements

- Require traffic to adhere to defined haul routes within the waste facility;
- Regularly maintain unpaved road sections by grading hardcore to minimise particulate matter generation;
- Maximise length of travel over paved road sections within the facility;
- Maximise separation distances between internal haul roads and sensitive receptors;
- Implement and enforce speed controls on all paved and unpaved roads;
- Direct all existing traffic through wheelwash / wheel-cleaning equipment;
- Use road sweepers on paved road sections as and when required;

Monitoring

- Undertake dust deposition monitoring close to sensitive receptors around the perimeter of the waste facility and undertake reviews of ambient emissions at regular intervals to determine the effectiveness of dust management and control systems.

The *BAT Guidance Note for the Waste Sector : Landfill Activities (2011)* and the *Environmental Management Guidelines for the Extractive Industry (2006)*, both published by the EPA, indicate that a total dust deposition limit of 350mg/m²/day measured close to sensitive receptors / at site boundaries is appropriate for the proposed inert landfilling and materials recovery / recycling activities (i.e. production of recycled aggregate).

Air (CO₂) Emissions

The landfilling of inert waste / soil and restoration of the former extraction void at Ballinclare Quarry will, for the most part, entail use of conventional diesel powered HGV trucks and earthmoving equipment (mechanical excavators and/or bulldozers). There is only minor scope to increase the efficiency of HGV's, plant and earthworking equipment and to reduce emissions arising from their use and deployment at the proposed waste facility.

The following BAT measures will be implemented in order increase efficiency and to limit, abate and/or reduce carbon dioxide emissions generated by HGVs and plant at the facility:

- Ensure all vehicles, plant and equipment based at the facility are regularly serviced and maintained and operating efficiently;
- Replace plant and/or vehicles at the end of their operational life;
- Ensure plant and equipment are switched off when not in use;
- Minimise, insofar as possible, vehicle movements across the facility;
- Review opportunities to increase the proportion of sustainable biofuel used by HGVs travelling to and from the facility, and incentivising its use wherever practicable.

The proposed development also offers potential to reduce carbon emissions through implementation of 'backloading' systems whereby trucks delivering soil or C&D waste to the facility, rather than depart the facility empty, pick up a consignment of recycled aggregate and deliver it to a construction site (or one of the Applicant's facilities) on the return leg of the trip. The delivery of recycled aggregate product on the return leg will eliminate the requirement for another round trip to deliver natural aggregates from a quarry to the same site(s) and in so doing will effect a reduction in carbon emissions.

Noise Emissions

The following BAT measures in respect of potential noise generation activities will be implemented at the proposed inert landfill and materials recovery / recycling facility at Ballinclarre Quarry in order to minimise and control noise emissions:

Facility Layout / Design

- Retain any perimeter banks or vegetation around the property boundary to provide acoustic as well as visual screening;
- Ensure plant and equipment at the facility work below original ground level within the existing quarry footprint insofar as possible in order that former quarry faces can be used to provide additional acoustic screening.

Management and Working Practices

- Ensure noise generating activities within the facility are undertaken in locations where noise attenuation would minimise the potential noise related impact at nearby noise-sensitive properties;
- Ensure that, wherever possible, internal haul roads are routed so as to maximise the separation distances to nearby noise-sensitive properties;
- Ensure all haul roads are kept clean and maintained in a good state of repair (i.e. any potholes would be filled and large bumps removed, to avoid unwanted rattle and “body-slap” from heavy goods vehicles);
- Ensure heavy goods vehicles entering and leaving the facility have tailgates securely fastened;
- Ensure all mobile plant and equipment used at the facility have noise emission levels that comply with the limiting levels defined in EC Directive 2000/14/EC and any subsequent amendments thereof (transposed into Irish law under S.I. No. 632 of 2000, as amended);
- Ensure plant is operated in a proper manner with respect to minimising noise emissions (e.g. minimisation of drop heights, no unnecessary revving of engines, plant used intermittently not left idling);
- Ensure all plant is subject to regular maintenance (i.e. all moving parts kept well lubricated, all cutting edges kept sharpened, the integrity of silencers and acoustic hoods maintained);
- Ensure all plant and equipment at the facility is fitted with effective exhaust silencers which are maintained in good working order to meet manufacturers’ noise rating levels. Defective silencers to be replaced immediately.

Monitoring

- Undertake noise monitoring close to sensitive receptors around the perimeter of the waste facility and undertake reviews of emissions at regular intervals to determine the effectiveness of noise management and control systems.

The *Guidance Note for Noise in Relation to Scheduled Activities (2007)* and the *Environmental Management Guidelines for the Extractive Industry (2006)*, both published by the EPA, indicate that a rated noise emission limit of 55dB(A) L_{Ar} during daytime working hours and 45dB(A) L_{Ar} during night-time hours is appropriate for the proposed inert waste landfilling and materials recovery /recycling activities (i.e. production of recycled aggregate).

Emissions to Land / Water

The waste recovery facility at Ballinclare Quarry is located within the Water Framework Directive (WFD) Ovoca-Vartry Catchment and the Redcross Sub-Catchment. At the EPA sub-basin level, the quarry is within the Potter's River catchment. Potter's River is located to the north and east of the quarry, approximately 300m from the site at its closest point. It flows in an easterly direction initially and then turns to flow in a south-easterly direction. The Kilmacurra Stream is located c.200m to the south of the quarry and flows in an easterly direction, to its confluence with the Potter's River.

At the present time, rainfall across the existing quarry (including the former concrete / asphalt production yard) generates run-off which generally falls to the existing quarry void, while run-off across the western side of the quarry site falls to the drainage channel leading off-site to the Ballinclare Stream. Given that the diorite bedrock is a poor aquifer, there is relatively little infiltration to ground or recharge to the underlying groundwater table.

Since extraction and production activities ceased in 2016, the quarry void has been flooded with surface water run-off and groundwater ingress and water levels have risen to cover the quarry floor.

The current discharge licence issued by Wicklow County Council in respect of the existing quarry development (WPL 116, dated 1 November 2019) provides for the ongoing off-site discharge of water which has collected in the quarry void. The discharge licence provides for water to be pumped from the existing sump (using a rising main pipe) to a treatment unit located at the former storage area. The approved water treatment system comprises a bespoke Siltbuster treatment system and is necessary to treat naturally elevated levels of arsenic in the water collecting in the quarry void. As well as reducing arsenic concentrations, the unit also removes suspended solids from the water. Following treatment, surface water run-off flows under gravity towards the existing network of settlement lagoons for further polishing and sediment removal.

Ballinclare Quarry is underlain by the diorite bedrock which is classified as a poor aquifer which is generally unproductive except in local zones (PI). Within the wider groundwater body, the majority of groundwater flow is reported to occur in the upper 3m of bedrock. Flow is mostly along a weathered zone in the bedrock, with flow in a lateral direction towards rivers and springs. When it was operating, the former quarry was effectively worked dry, with very little inflow of groundwater recorded into the quarry void, indicating the surrounding bedrock is relatively impermeable.

Groundwater vulnerability mapping indicates that the underlying aquifer is classified as 'E' (Extreme) or 'X' (rock at or near the surface, or karst), reflecting the fact that there is little or no subsoil cover present at the site. Groundwater level data show highly localised variations around the existing quarry and do not indicate a particular groundwater flow direction. Localised groundwater flow in the area is presumed to be towards the Potter's River, to the south and east of the quarry, with regional groundwater flow towards the coast to the east.

Although the inert waste streams to be imported and landfilled at Ballinclare Quarry are inert and expected to be free from contamination, there is a minor risk that the waste activities could result in contaminant emissions to land and groundwater, specifically from placement of non-inert waste, the presence of suspended solids in surface water run-off and spills / leaks of fuel and oil.

The following BAT measures will be implemented at the proposed inert landfill and materials recovery / recycling facility to minimise uncontrolled release of polluting materials or liquids / liquors to land, surface waters and groundwater:

Land

- Establish robust waste acceptance procedures and management systems to identify the source of imported waste materials in advance and to confirm that they are inert and acceptable for intake to the waste facility;
- Implement a multi-level testing regime for all waste which is imported and placed in the inert landfill (soil / particulate materials / sludge). Testing to comprise prior characterisation testing, compliance testing and on-site verification;
- Ensure that any imported waste which is suspected to be non-inert is transferred to the waste inspection and quarantine area (a covered shed constructed over a concrete slab) and held there pending receipt of test results;
- Remove any quarantined materials that prove to be non-inert off-site, for disposal or recovery off-site, at another authorised waste facility.

Water

- Water currently ponding in the quarry void will continue to be treated at a water treatment plant and passed through the existing settlement lagoons / attenuation pond prior to being discharged to the Ballinclare Stream (in accordance with the existing SW discharge licence);
- Ensure all fuels, oils, lubricants and other potentially hazardous chemicals held at the facility are stored in
 - large tanks surrounded by protective concrete barriers / containment bunds in order to eliminate the potential for mobile plant to collide or impact with them;
 - smaller drums or intermediate bulk containers (IBCs) on bunded pallets surrounded by protective barriers;
 - double skinned containers and/or mobile bowsers.
- Undertake regular visual inspection and testing of the integrity of tanks, drums, bunded pallets and double skinned containers;
- Ensure all domestic wastewater from the staff welfare facilities via existing septic tanks and wastewater treatment facilities prior to discharging effluent to ground;
- Ensure all vehicle re-fuelling is undertaken on the sealed hardstand area adjacent to the existing workshop and fuel storage tank (which is connected to a hydrocarbon separator). On occasion, if re-fuelling is undertaken elsewhere from a mobile double skinned fuel bowser, a drip tray shall be used ;
- Maintain and test the integrity of drainage infrastructure, including drainage pipework and the hydrocarbon interceptor at regular intervals ;
- Undertake maintenance of plant and machinery over paved surfaces, at the existing workshop or on the hardstand refuelling pad (or alternatively off-site, if appropriate);
- Ensure all plant is regularly maintained and inspected daily for leaks of fuel, lubricating oil or other contaminating liquids / liquors ;
- Ensure all petroleum-based products (lubricating oils, waste oils, etc.) and greases are stored on drip trays and under cover (at the workshop).
- Ensure waste liquids and containers will be collected and disposed of by a suitably licenced contractor;
- Ensure spill kits (with containment booms and absorbent materials) are available on-site to contain / stop the migration of any accidental spillages, should they occur;
- Ensure plant operators are briefed by way of 'toolbox' talks and on site induction as to where the spill kit is kept and how and when it is deployed;
- Establish a traffic management system at the facility to reduce conflicts between vehicles, and the potential risk of collisions and associated fuel spills or oil leaks;

- Establish and enforce speed limits across the facility to further reduce the likelihood and significance of collisions and the possibility of a fuel leak from such a collision.

In addition, the following BAT measures will also be implemented to protect surface water and groundwater resources:

Inert Landfill Liner

Suitable uncontaminated natural, undisturbed soil waste and/or soil by-product (i.e. non-waste) which conforms to an engineering specification will be imported for construction of the 1m thick basal and side clay liners required for the inert landfill. The clay liner will be of sufficiently low permeability (less than or equal to $1 \times 10^{-7} \text{m/s}$) to provide an appropriate level of protection to groundwater and the surrounding aquifer, in line with accepted inert landfill design standards (and current legislative requirements).

On-site Passive Wetland Treatment System

A separate drainage system will be provided to reduce pressures and dewater groundwater beneath the basal liner. Dewatered groundwater and storm runoff from the inert landfilling activities will be collected at a sump and pumped up to the approved (Siltbuster) treatment plant and from there to a proposed on-site (passive) wetland treatment system before being discharged off-site to the Potters River.

The sizing and design of the wetland treatment system has been developed having regard to the likely contaminants (and concentrations thereof) which could be present in the inert soil / C&D waste intake imported from construction sites. The effectiveness of the proposed wetland treatment systems can be enhanced by the temporary deployment of more active treatment systems, such as chemical dosing, aeration or other such processes. This can allow a wetland system to handle higher contaminant loads or flows for periods of time (should it be necessary) before reverting to more standard (passive) modes of operation, therefore providing flexibility should leachate generation rates and chemical constituents change over time.

It is envisaged that the existing waste treatment system will remain in service for the duration of the ongoing dewatering activities and as may be required thereafter for the subsequent landfilling operations. Based on the initial assessment and design, the proposed wetland treatment system at Ballinclare Quarry will also comprise the following:

- (i) A leachate reception tank : up to 50m^3 , self-bunded storage tank with level controls.
- (ii) A pump house : housed in a standard shipping container (6.0m x 2.4m x 2.6m) containing feed, discharge and chemical dosing pumps;
- (iii) A wetland treatment system: comprising the following elements in series
 - (a) Anaerobic (biochemical reactor) wetland;
 - (b) Iron Sequestering Unit (ISU);
 - (c) Aerobic wetland.
- (iv) Off-site discharge via existing ditch / drainage channel to the Ballinclare Stream and the Potters River further downstream.

The proposed wetland system will be constructed in phases, as required, to achieve required water quality discharge limits.

Monitoring

- Undertake frequent and regular monitoring of surface waste quality (prior to and post treatment) and groundwater quality;
- Undertake review of off-site discharges / emissions on ongoing basis to determine / demonstrate the effectiveness of water management / water treatment systems.

It is expected that by implementing these measures, emissions to surface water will meet the quality threshold values for key indicator parameters (BOD, suspended solids, total ammonia, total nitrogen and total phosphorous set by the *BAT Guidance Note for Waste Sector : Landfill Activities (2011)* and additional parameters (metals, priority substances etc.) required by any waste licence issued in respect of the proposed facility.

Environmental Liabilities

Operation of the proposed inert landfill and materials recovery / recycling facility could give rise to both known and potentially unknown future liabilities, principally in respect of land and/or groundwater and also, to a lesser extent, to atmosphere. Some potential liabilities could also arise in respect of the future closure, restoration and aftercare of the facility. Failure to make adequate financial provision for these liabilities could give rise to adverse impacts on the environment.

In order to identify and quantify these prospective liabilities, a Closure, Restoration and Aftercare Management Plan (CRAMP) and Environmental Liabilities Risk Assessment (ELRA) will be prepared and agreed with the EPA in due course, subject to the requirements of any future waste licence which may be issued in respect of the proposed waste facility.

The amount of financial provision required in respect of unexpected facility closure or site remediation following significantly adverse environmental incident will be agreed with the EPA as required on foot of a risk assessment.

Transport of Mud onto Roads

The landfilling and material recovery / recycling activities at Ballinclare Quarry will generate significant HGV / articulated truck movements over areas of unpaved ground within the waste facility and as such, in unfavourable weather conditions, could result in mud being carried off-site and onto the public road network, giving rise to potential health and safety risks to other road users.

The following BAT measures are implemented in order to limit, abate and/or minimise deposition of mud on public roads by HGV's, articulated trucks and other vehicles exiting the waste facility.

- Direct all traffic exiting the facility through the wheelwashing facilities and over paved internal roads thereafter out to the public road network;
- Regularly clean and maintain the wheelwashing facilities;
- Use a road sweeper to clean local public roads as and when required
- Maximise travel over paved road sections within the facility;
- Regularly inspect and maintain any unpaved road sections within the facility so as to minimise potential accumulation of mud on wheels of HGVs and articulated trucks.

Environmental Management Systems

Kilsaran Ltd. currently implements its Environmental Management System (EMS) in respect of waste recovery activities at a number of other licenced / permitted waste facilities across Ireland.

The EMS is subject to ongoing review and development and Kilsaran will update the existing EMS as required in due course to incorporate any additional mitigation measures and management procedures which may be necessary at Ballinclare Quarry to

- mitigate specific impacts and emissions arising from the proposed landfilling and materials recovery / recycling activities and
- further implement best practice environmental management and control measures in respect of the planned waste activities.

An environmental monitoring programme will continue in force at the proposed waste facility for the duration of the landfilling and recovery / recycling operations. Emission limit values for the landfilling and recovery activities are generally consistent with those set by previous and/or existing planning permissions and/or environmental permits.

The environmental management measures and BAT techniques outlined above will be reviewed and revised in light of conditions attaching to any waste licence issued by the EPA in respect of the planned waste activities at Ballinclare Quarry.